HIM Lecture 6

The Political Economy of Intelligent Technology

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If you care about (AI) Ethics, you care about Society. If you care about Society, you care about Political Economy

A social sciences discipline that derives from moral philosophy, and concerns how economies work, and how they should be run.
I've only been working in this field a few years, this lecture has a lot of my current research. Bleeding edge is not always most accurate.

AI, Employment, and Inequality

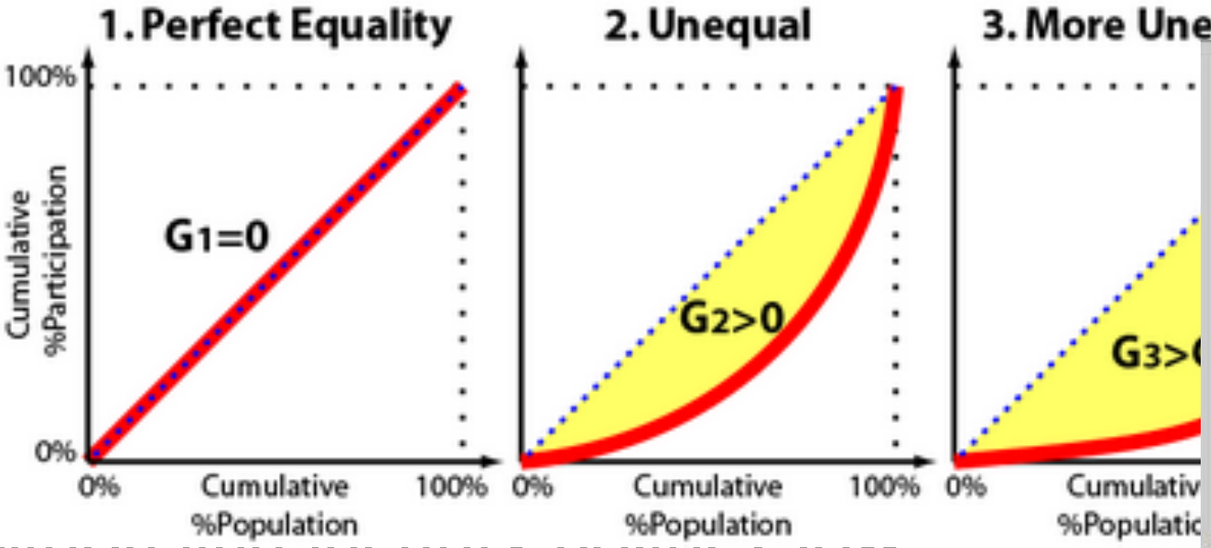
- AI may be increasing inequality, by making it easier to acquire skills. This reduces an aspect of wage differentiation – a factor which is believed to benefit redistribution.

- Example 1: More bank tellers than before ATMs. Because each branch has fewer tellers, so branches are cheaper, so more branches.
  - Tellers are now better paid, but fewer branch managers, who used to be really well paid.
- Example 2: Now more accountants than before spreadsheets.
- Example 3: There aren't enough truck drivers, because it's no longer a well-paid job.
  - Power steering + GPS + excel = more drivers, lower wages.

What is inequality and how is it measured?

The Gini Coefficient is half of the relative mean absolute difference in wealth.

$$\frac{\sum_{i=1}^{n}\sum_{j=1}^{n}|x_i - x_j|}{2n\sum_{i=1}^{n}x_i}$$



- Empiri
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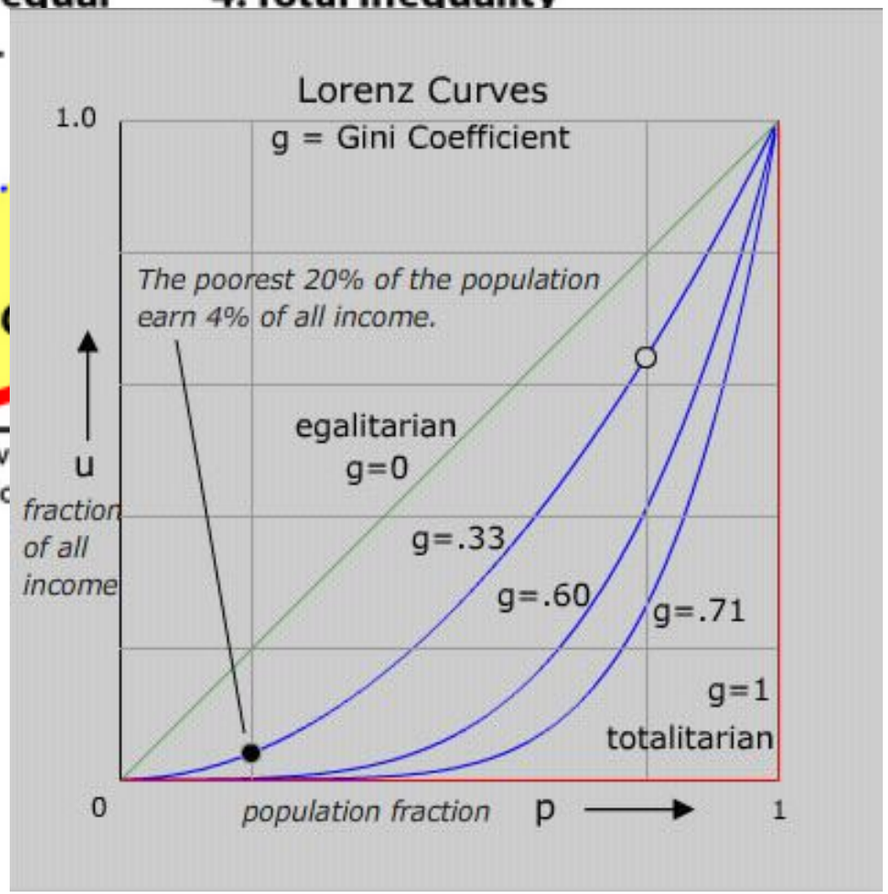
  polarisation and identity politics, low levels of cooperation, and (in democracies) tight election outcomes.



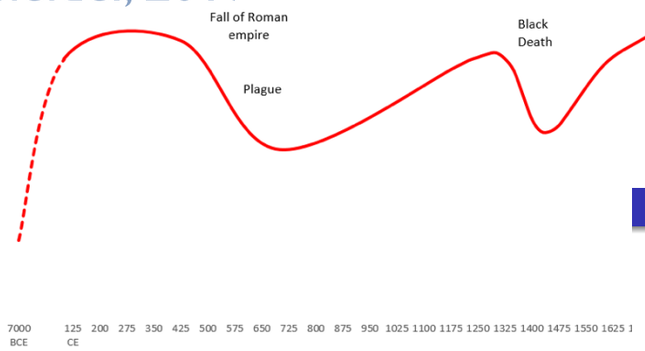
What is inequality and how is it measured?

and Does it have anything to do with AI?

We've Been Here Before

Polarization and the Top 1%

Scheidel, 2017



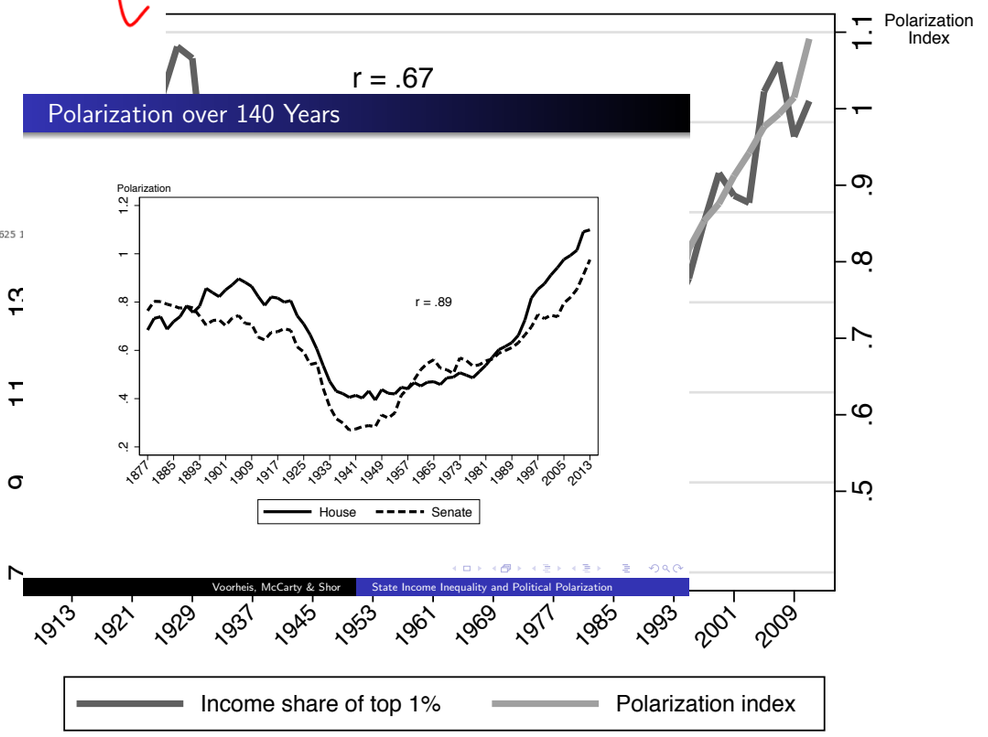


Figure 1.2: Top One Percent Income Share and House Polarization

Polarisation ∝ Inequality

- Late 19C inequality perhaps driven by then-new distance-reducing technologies: news, oil, rail, telegraph.
- Great coupling – wages track productivity – probably due to policy. Social spending, blocked wealth extraction?
- Required elite to realise that uncertainty and violence of high inequality is too costly for them too.
- Empirically, ideal gini coefficient is around .27, not zero.

Polarization and the Top 1%

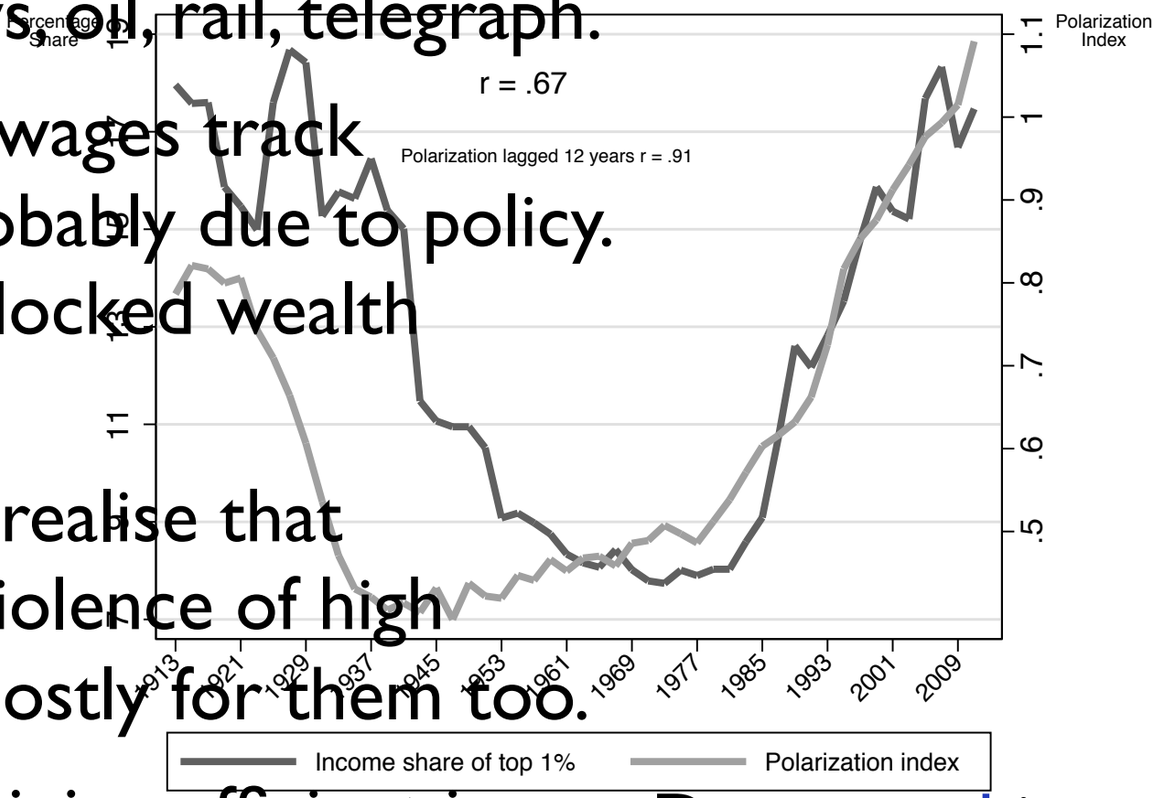
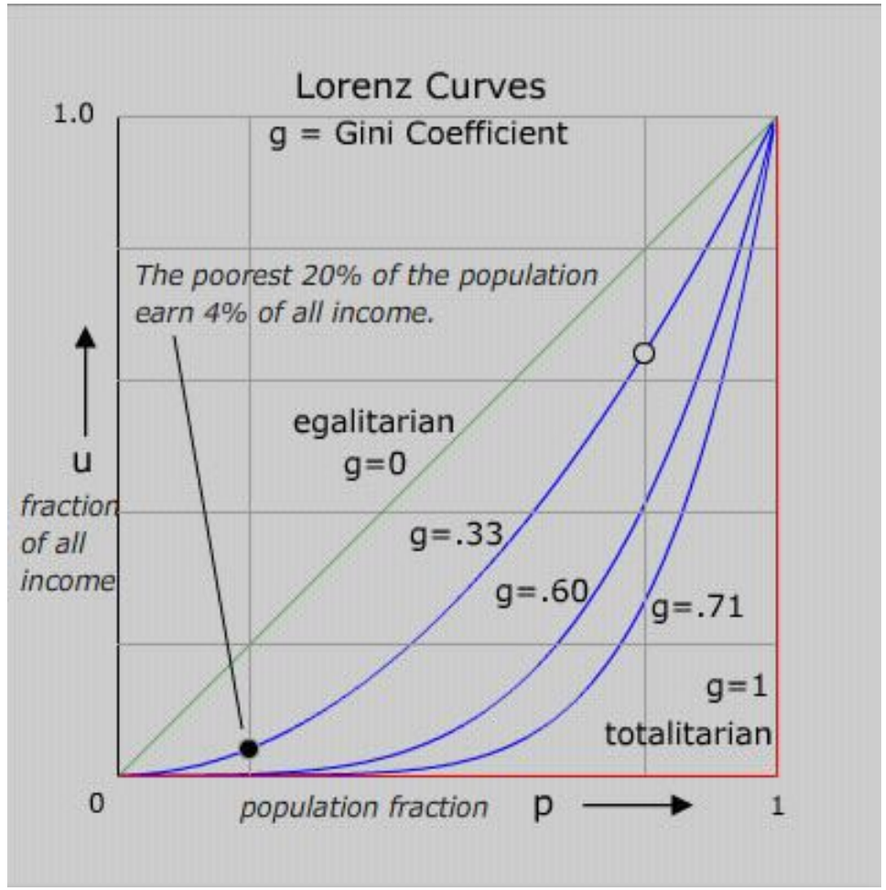


Figure 1.1: Top One Percent Income Share and House Polarization

- Do reward innovation, motivate and empower excellence.

- Empirically, Gini =.27 ~ ideal. 0 is too low, (need to reward excellence); .3–.4 social disruption; > .4 economy starts tanking. Why?
- Work in progress, best guesses at problem:

1. Bifurcation of society: loss of social mobility, empathy.
2. Extreme risk taking by rich leaders seeking status, who provide patronage to politicians who profess their extreme beliefs.
3. Populists coalesce their identity politics around these extreme-positioned leaders = costly signalling.



What we want: to get people to sign up for redistribution **before** two 'world' wars.

One key concept: **public goods**

Public Goods Investment

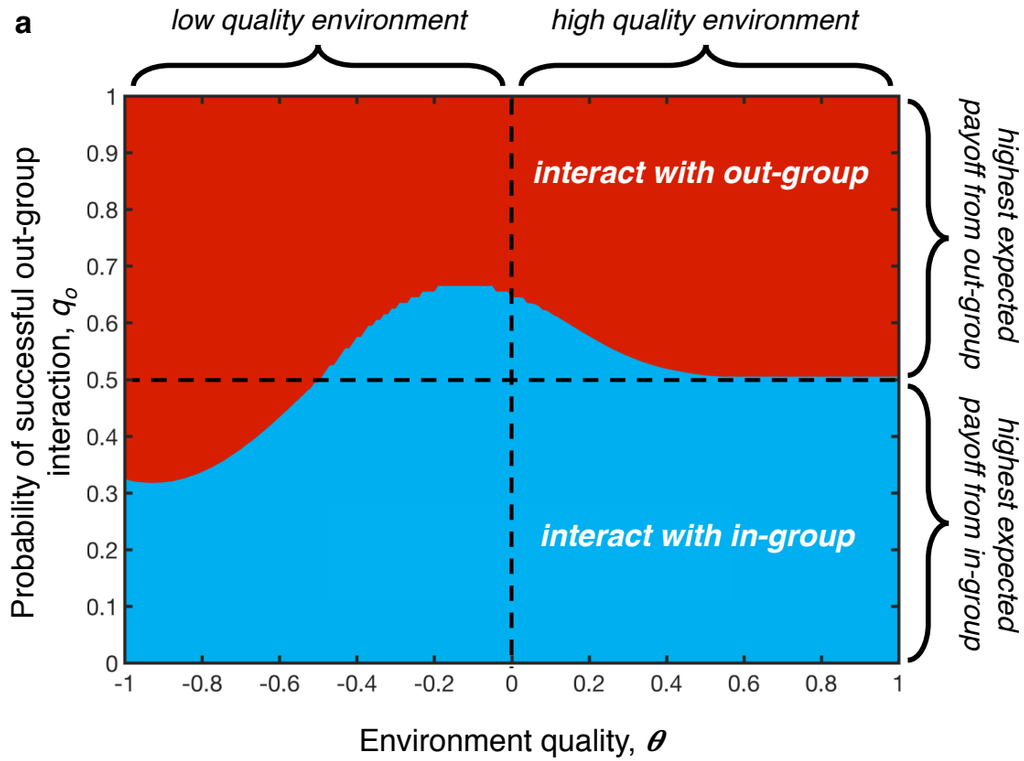
- Public Goods are those with no one clear owner. Examples: bridges, clean air, public health, grazing commons.
  - None are really entirely public, just different levels of control / access compared to conventionally private goods.
  - Therefore it makes sense to invest, provided those who invest are at least slightly more likely to benefit (or others who behave like them because of them).
  - Hamilton's Law: cooperation is feasible where:

$$cost_i < \sum_{i=0}^{N} (benefit_j \times relatedness_{ij})$$

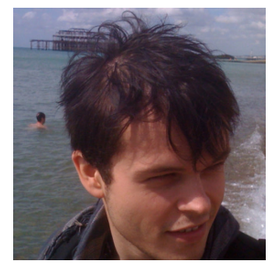
Inequality ∝ Polarisation

Possible explanation, in arXiv, work with Nolan McCarty, Alex Stewart

- Model assumptions: In-group cooperation has more certain–but also lower on average–payoff.
- Model outcome: when ecosystem offers poorer support, more likely to be optimal to focus on ingroup, but if things really bad, outgroup risk gets better again.
- In some contexts, polarisation can gradually increase, but cannot gradually decrease–may mandate structural change.



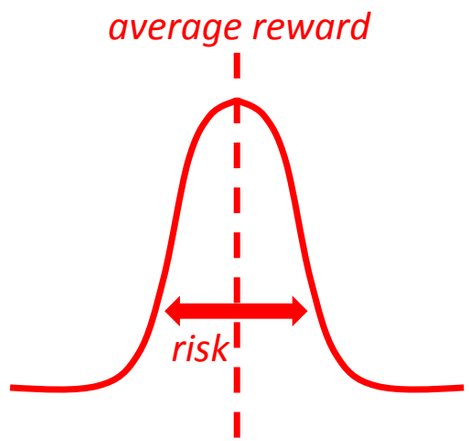
Not peer reviewed yet; may be wrong.



Slides originally from Alex Stewart

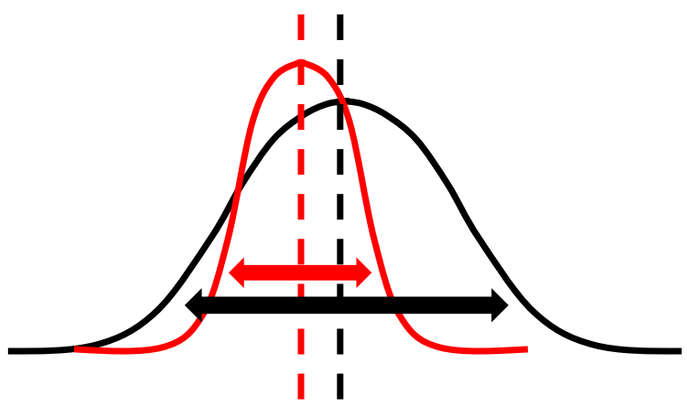
Risk and Reward

- Suppose success (e.g. resources gained) depend on social interactions.
- In-group interactions are safe but not innovative (lower reward, lower risk).



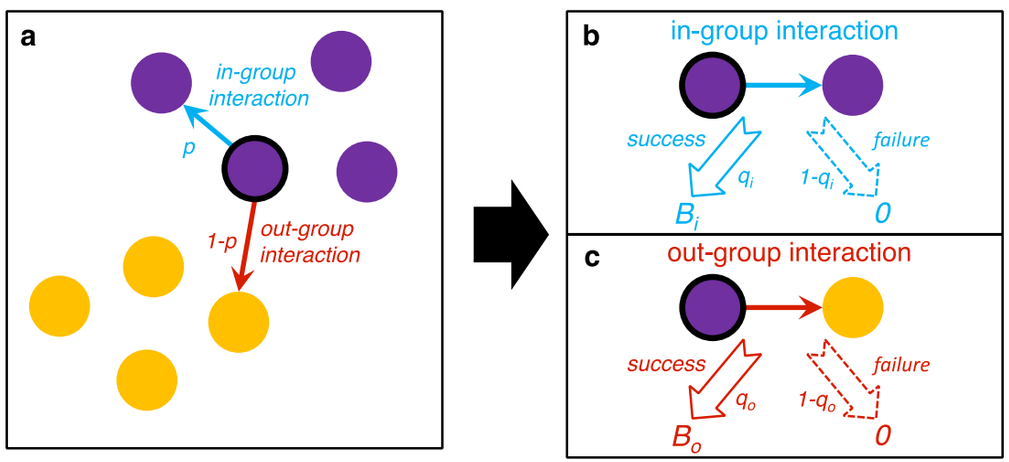
Intuition: Risk and Reward

- Suppose success (e.g. resources gained) depend on social interactions
- In-group interactions are safe but not innovative (lower average reward, but lower risk)
- Out-group interactions are risky but innovative (higher average / expected reward, higher risk)



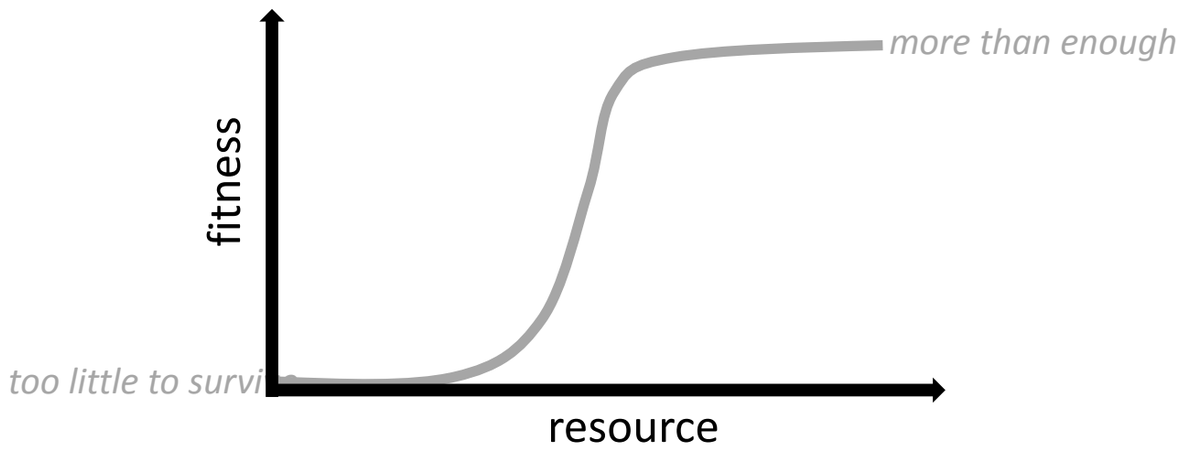
Model: In-group vs Out-group

- Each player chooses whether to interact with an in-group or out-group member. (No difference between agents / groups except an arbitrary flag.)
- The interaction is successful with fixed probability.
- Benefits are greater for out-group interaction, but probability of success is lower.



Intuition: Fitness benefits

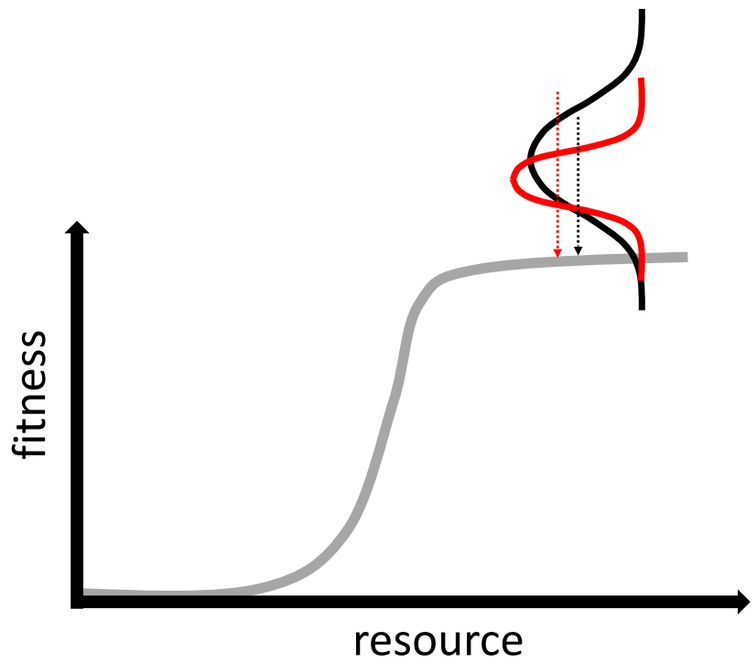
- Benefits from resources typically accumulate *non-linearly…*
  - An extra pound has less impact on a billionaire than on a beggar.
- Marginal resource benefit depend on overall availability.



Note: I replicated this with a spatial, agent-based model, and didn't need this assumption to get the same results.

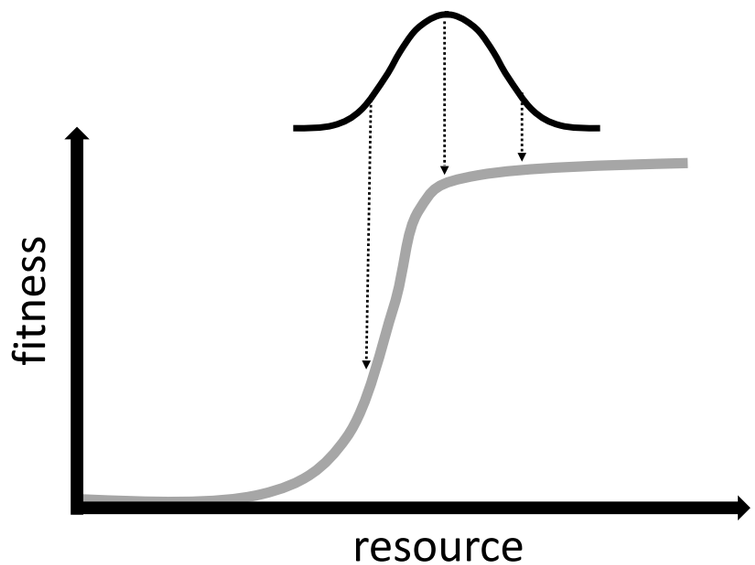
Intuition: Expected benefits

- When times are good risk isn’t such a big deal.
- It’s average expected benefit that matters.



Intuition: Risk aversion

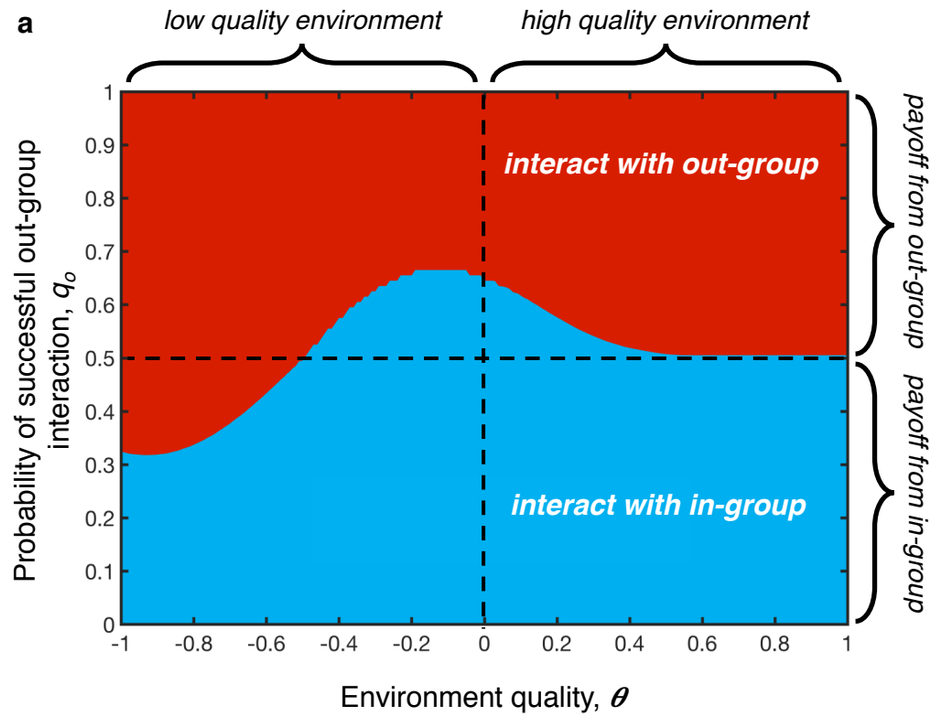
- When resources become scarce, risk becomes problematic.
- Loss from a bad interaction starts to outweigh gains from good.



When should you invest in the public good?

$$cost_i < \sum_{i=0}^{N} (benefit_j \times relatedness_{ij})$$

- Trick question: no single solution.
- Tradeoffs determined by costs and benefits, and other investment options.
- Hueristic (cf. Stewart, McCarty & Bryson model): in a good economy, may want to focus on growing the pie, in a weak economy, may feel safer focussing on yourself (fighting for a bigger slice / wedge of pie.)



What we want

- Help people realise that there is such a thing as non-zero-sum games, there are times to invest.
- Help them realise that they aren't stupid to have been skeptical about this, because you can over-invest in public goods.
- Help them make agile social investments, collaborate to facilitate redistribution, sensible infrastructure investment, crack down on corruption, etc.

What 'we' did:

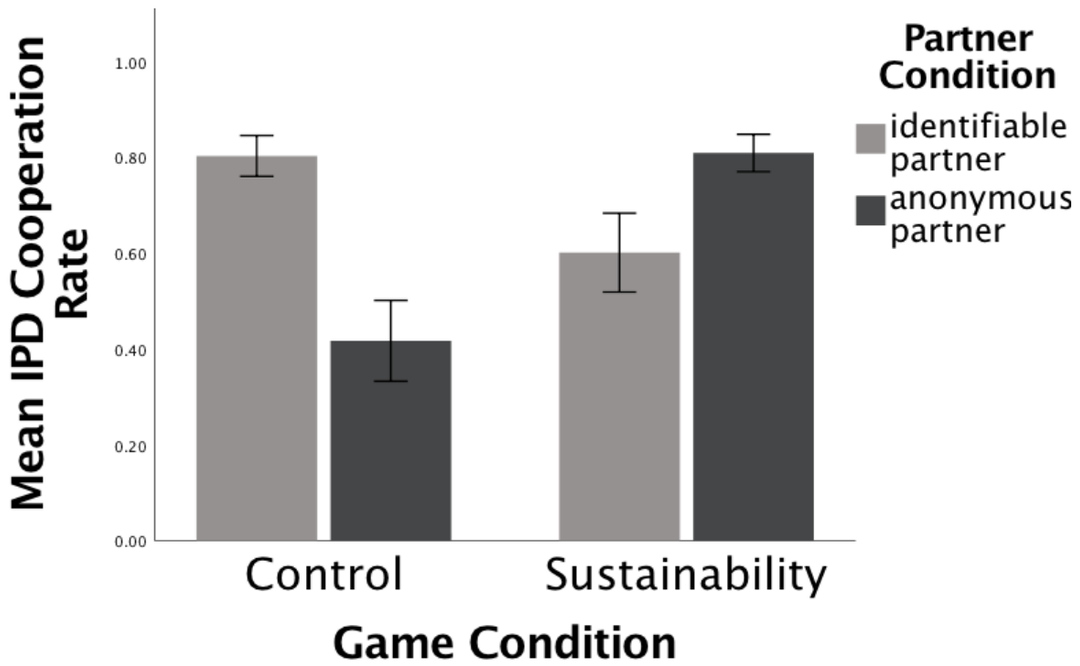
Build a Game

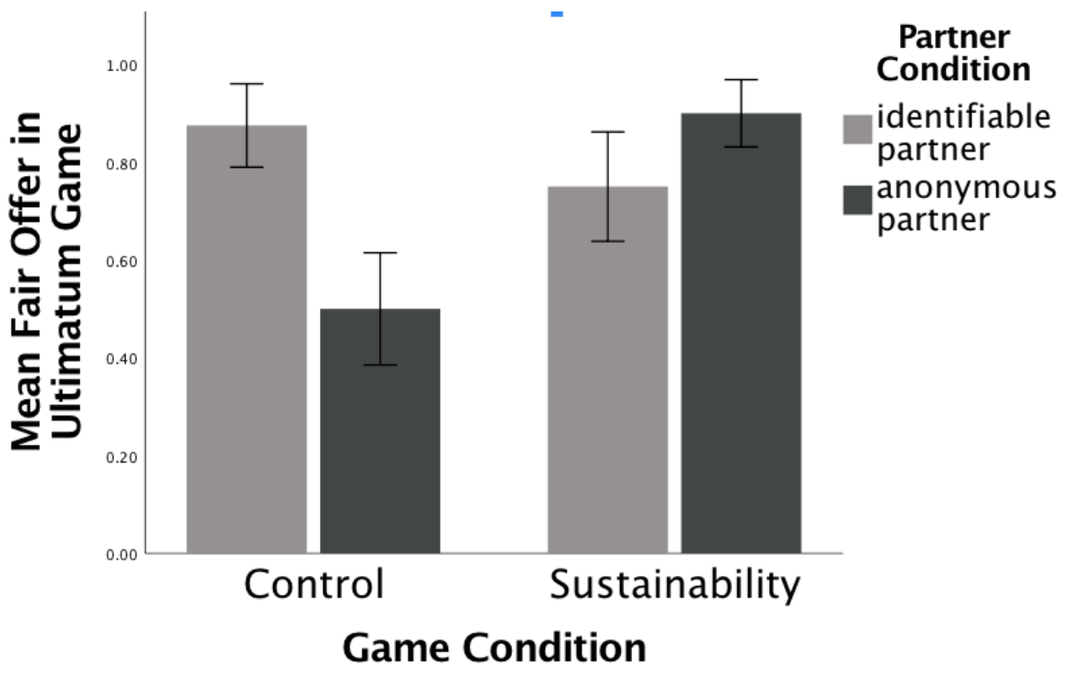
The Sustainability Game

The Sustainability Game

- Agents (Spiriduși) may invest in eating (self) housing (family, reproduction) or bridges to more food (community.)
- Game's goal is to balance Spiriduși goals to keep population alive, or maximise average life expectancy, or minimise infant mortality, or… (implicit lesson in moral philosophy!)
- Question: can this help subjects better invest in the public good?

Answer: Define "better"





Increases cooperation with anonymous partners, increases competitiveness with identified partner.

(Theodorou, Bandt-Law, & Bryson 2019)

Ethics and Economics

- Claim I – Ethics is behaviour maintaining a society, contains both general principles and society-specific (identity) components.
  - We want to say "Our society is more ethical;" Instead have to name a metric, e.g. "our society is more ethical in terms of proportion of the population sharing economic benefits."
- Claim II – Economics is mechanisms maintaining sustenance, contains both basic needs (food, shelter) and social (security) components.
  - Jobs are not only about meeting basic needs, nor only about specialisation and redistribution, but also about generating social connections.

Summary & Future

- Normative suggestion: We need more redistribution (also liberty and diversity.)
- The impact of (intelligent) technology in political economy is complicated, but knowable; core to AI ethics, and a great project to work on.
- Next lecture: Regulation and Policy

Thanks (for the science)

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